RISKS AND COSTS OF REGULATORY PERMIT APPLICATIONS IN CANADA'S PIPELINE SECTOR

SUBMISSION TO THE NATIONAL ENERGY BOARD MODERNIZATION EXPERT PANEL

MARCH 31, 2017

GUY HOLBURN, Suncor Chair in Energy Policy and Director, Ivey Energy Policy and Management Centre, Ivey Business School

MARGARET LOUDERMILK, Adjunct Research Professor and Research Director, Ivey Energy Policy and Management Centre, Ivey Business School

This report was produced with funds provided by Natural Resources Canada. The opinions and views expressed are not necessarily those of Natural Resources Canada or the Government of Canada.

Introduction

The energy sector is a major contributor to Canada's economic prosperity, given the country's significant natural endowments of oil and gas resources.[1] Recent estimates put the sector's total contribution at more than 10% of Canada's gross domestic product and 5% of national employment.[2] In addition, the energy sector contributed an annual average of $22 billion to federal and provincial tax revenues over the past five years, and comprised 21% of Canadian domestic merchandise exports in 2015.[3,4] Accordingly, the continued health of Canada's economy depends on creating and maintaining a supportive environment for investment in environmentally- and socially-responsible energy infrastructure.

However, concerns have been raised that regulatory and political environments have become increasingly challenging for the energy sector, compared to both the recent past and other jurisdictions competing for large-scale capital investment by global multinational resource companies. Anecdotal evidence suggests that regulatory timelines and uncertainties and political interventions have increased project development costs and perceived project approval risks, making the energy and natural resource sectors less attractive for long-term capital commitments. For example, in the pipeline sector, the cost of developing and applying for regulatory approvals for major projects such as Northern Gateway, Energy East, and Trans Mountain Expansion is now in the $500 million to $1 billion range.[5]

At the same time, project developers perceive that the risk of regulatory or political denial, or of conditions of approval that make a project uneconomic, have materially increased. Evidence from other natural resource sectors, such as mining, indicates that these risks (e.g., increases in permitting times and uncertainty around land claims and regulatory processes) may already be reducing the attractiveness of Canada for investment in these highly competitive, global commodity markets relative to other developed countries like the United States, Europe, and Australia.[6] In the pipeline sector, it is notable that Canada's two largest companies, TransCanada and Enbridge, have recently shifted capital investment towards the United States and Mexico, which are viewed by some as having more favorable regulatory environments.[7] In addition, since

---

[1] See also Ivey Energy Policy and Management Centre Policy Brief, "Energy in Canada: A Statistical Overview", https://www.ivey.uwo.ca/cmsmedia/2110828/energy-in-canada-a-statistical-overview.pdf.
[2] Natural Resources Canada, Natural Resources Canada, Energy Markets Fact Book: 2016-2017, p.5.
[3] Natural Resources Canada, Natural Resources Canada, Energy Markets Fact Book: 2016-2017, p.8-10.
[4] All figures are in Canadian dollars unless otherwise specified.
[5] See, for example, Enbridge Inc., "Management's Discussion and Analysis", December 31, 2016, http://www.enbridge.com/.
[6] See Fraser Institute, "Annual Survey of Mining Companies, 2016" and "Permit Times for Mining Exploration in 2016", https://www.fraserinstitute.org/.
[7] In March 2017, Enbridge completed a $28 billion USD acquisition of the United States pipeline company Spectra Energy. Similarly, in 2016 TransCanada spent $13 billion USD to acquire the Columbia

2016 major foreign multinational energy companies, including Conoco Phillips, Marathon Oil, Royal Dutch Shell, Statoil and Total, have divested their Canadian oil sands holdings, contributing to the perception that Canada is a less attractive destination for oil and gas investment compared to some other jurisdictions.

Consideration of the effects of regulatory processes on firms' investment decisions yields questions about how to position the National Energy Board (NEB) as an efficient and effective energy regulator: What are the costs and risks for a project developer undertaking a regulatory application? How have these costs (both direct and indirect) changed over time? How do the durations of regulatory reviews and delays affect project feasibility and investment decisions?

This report provides preliminary results from a new program of research that investigates the impact of the current regulatory and political approvals processes for major hydrocarbon infrastructure projects on the investment environment for project developers, undertaken by the Ivey Energy Policy and Management Centre at Western University's Ivey Business School. The research is intended (1) to provide new data and evidence to assess the perception that both costs and risks of regulatory processes are changing, (2) to compare Canadian regulatory processes with those in other jurisdictions and sectors, and (3) to develop options for reform in Canada's federal approvals architecture. The preliminary results presented in this report articulate the typical costs of developing major Canadian pipeline projects, as well as the direct and indirect costs associated with pursuing and obtaining regulatory approvals from the NEB. In particular, we estimate the amount of private capital invested before a determination is made about the public interest need for a typical project, and discuss its effect on the required return on investment for a developer.

This project has a direct bearing on the NEB Modernization Panel's efforts to position the NEB as an efficient and effective energy regulator in that it increases understanding of the impact of regulatory and political uncertainty, and regulatory application costs, on investment in pipeline infrastructure.

Risk and Uncertainty in Applications for Pipeline Permits

As Canada's federal energy regulator, the NEB ensures that energy markets and infrastructure operate in the public interest, guided by environmental, safety, security, and efficiency standards. The agency regulates more than 73,000 kilometers (km) of pipelines and 1,400 km of power

---

Pipeline Group headquartered in Texas. TransCanada has also invested over $5 billion USD in eight pipeline projects in Mexico. In the words of TransCanada's chief executive officer (CEO) Russ Girling, "Clearly, what we have found is the risk that we need to take in Mexico to participate in a large-scale infrastructure investment is far less [than in North America]." Bakx, Kyle, CBC News, "TransCanada finds warmer welcome in Mexico for pipeline business", 15 May 2016.

lines. The functioning of the NEB is primarily defined by the National Energy Board Act (amended in 2012) and the Canadian Environmental Assessment Act (also as of 2012). The broad criterion the NEB applies when assessing pipeline applications is whether they advance the "public interest". While the NEB Act does not define the public interest, it does specify the factors the NEB must consider in deciding whether to approve or deny pipeline certificates, including economic feasibility, availability of the commodity to the pipeline, existence of relevant markets, financial status of the applicant, and opportunities for Canadians to participate in economic development of the pipeline. In addition, the NEB has the authority to include conditions on any approval deemed necessary for ensuring the pipeline operates in the public interest.

The NEB describes its responsibility to serve the public interest as referring to "a balance of economic, environmental, and social interests that change as society's values and preferences evolve over time. As a regulator, the Board must estimate the overall public good a project may create and its potential negative aspects, weight its various impacts, and make a decision."[8] The NEB's decisions and recommendations are consequently based on an imprecisely defined set of criteria, giving the NEB discretion and flexibility in exercising its authority.

For major pipeline projects (those over 40 km in length) the federal government has the authority and discretion to intervene after the NEB has made its determination, creating a degree of political risk for stakeholders. Two structural features of the broader approvals process for pipeline projects introduce political risk.

First, the NEB does not make the final approval for a major pipeline application in the same way that the Federal Energy Regulatory Commission (FERC) does in the United States, but instead submits its recommendation to the government for its review and approval or denial. The NEB Act gives the Governor in Council (GIC) the final decision on whether to issue a Certificate of Public Convenience and Necessity. Accordingly, the GIC has the option to direct that a certificate be issued, that the application be dismissed, or that the Board reconsider either the recommendation or any attached conditions. Prior to 2012, the NEB made the decision on issuing a certificate, which then required confirmation by the GIC—that is, the GIC could refuse to confirm an NEB approval but could not approve a project for which the NEB had denied a certificate.[9] Among OECD countries, it is unusual for the government to make the final approval decision on a major pipeline project, rather than an independent regulatory agency. In the United States, the elected legislative or executive branches of government do not have a role in the

[8] National Energy Board, Presentation to the Expert Panel Conducting the NEB Modernization Review, 29 Nov 2016.

[9] In addition, amendments to the NEB Act in 2012 created a 15-month time limit for NEB review once a project application was deemed complete, consolidated environmental assessment responsibilities within the NEB, created new enforcement and compliance mechanisms, and limited stakeholder participation in NEB hearings to those "directly affected" or "with relevant information and expertise."

approvals process, which is entirely delegated to FERC, except when a pipeline crosses an international border. [10]

Second, when reviewing NEB recommendations, there are no specified criteria to guide or constrain GIC decisions. The amended NEB Act states simply that [emphasis added],

> After the Board has submitted its report under section 52 or 53, the Governor in Council may, by order, direct the Board to issue a certificate in respect of the pipeline or any part of it and to make the certificate subject to the terms and conditions set out in the report; or direct the Board to dismiss the application for a certificate. *The order must set out the reasons for making the order*.[11]

The absence of legislated decision-making criteria for GIC orders confers an unusually large degree of discretion on the government to justify its decision on virtually any grounds. The government may disagree with elements of the NEB's reasoning or it may introduce new reasons for its decision, all of which can create uncertainty for project proponents and also for the NEB in making their assessments. By contrast, the Investment Canada Act specifies, in detail, the criteria the government must adhere to in its determination of whether major foreign direct investment in the country is permitted. The Act states that in determining whether an investment is of "net benefit" to Canada, the Minister will consider the following factors:

> (a) the effect of the investment on the level and nature of economic activity in Canada, including, without limiting the generality of the foregoing, the effect on employment, on resource processing, on the utilization of parts, components and services produced in Canada, and on exports from Canada;
> (b) the degree and significance of participation by Canadians in the Canadian business or new Canadian business, and in any industry or industries in Canada of which the Canadian business or new Canadian business forms or would form a part;
> (c) the effect of the investment on productivity, industrial efficiency, technological development, product innovation, and product variety in Canada;
> (d) the effect of the investment on competition within any industry or industries in Canada;
> (e) the compatibility of the investment with national industrial, economic, and cultural policies, taking into consideration industrial, economic, and cultural policy objectives enunciated by the government or legislature of any province likely to be significantly affected by the investment; and

[10] A Presidential Permit through the State Department is required when a pipeline crosses a national border in the United States.
[11] National Energy Board Act, section 54.

> (f) the contribution of the investment to Canada's ability to compete in world markets.[12]

The specific Investment Canada Act criteria for Ministerial decisions creates a more predictable policy environment for multinational corporations when weighing the relative attractiveness of Canada as a potential investment location. The absence of specific criteria for GIC decisions on major pipeline applications, however, exposes project proponents to a greater level of uncertainty and political risk, especially for projects that are heavily contested by stakeholder groups. This concern is articulated by Gaétan Caron, former chair and CEO of the NEB, in an opinion regarding the current difficulties in regulatory review of energy infrastructure projects:

> The main obstacle to these determinations being made . . . is the fact that regulatory processes have become politicized before their completion. When federal politicians take a stand on projects being assessed by a federal regulatory body like the [NEB], they're saying they've made up their mind before the regulatory review has been completed, or in some cases, before it has even started. Understandably, this is seen by many as an expression of indifference or distrust towards the regulatory process, making people believe the regulatory review does not matter or its outcome has been pre-decided.[13]

In addition, the ability of the government to ultimately approve or veto major pipeline applications encourages stakeholders to exert pressure directly on the government and to politicize project approvals, circumventing the quasi-judicial regulatory role of the NEB. Stakeholders may also introduce policy issues and arguments in NEB hearings on a project application that are outside the remit of the NEB but which may nonetheless be subsequently considered by the GIC. Peter Watson, current chair and CEO of the NEB, describes the increasing demands for stakeholder input in the regulatory process:

> A challenge we regularly face with respect to public participation in pipeline hearings is the frequent difference between the expectations of participants and our legislated mandate reflecting changes in the NEB Act in 2012. Many participants expect to be heard on policy or system-level issues, such as climate change, that are outside of our project-specific mandate.[14]

In addition to contestation through the traditional regulatory hearing process, stakeholders and the general public have the right to appeal NEB, GIC, and related decisions and rulings to the Federal Court of Appeal and the Supreme Court of Canada. In the past three years, approximately 50 such cases have been filed by a variety of municipalities, Aboriginal groups,

---

[12] Investment Canada Act, sections 20 and 21.
[13] MacDonald-Laurier Institute, "Straight Talk: Gaétan Caron", April 2016.
[14] Peter Watson, National Energy Board Technical Briefing for the NEB Modernization Expert Panel, 29 Nov 2016.

environmental groups, and individuals in relation to 13 projects. These court challenges further add to the level of uncertainty and process risk for project developers; this is most notable in the case of Northern Gateway, a pipeline initially approved by the GIC in 2014. The GIC decision was challenged in court based on inadequate consultation with Aboriginal groups, and the Order in Council was sent back to the GIC for redetermination. In November 2016, the GIC subsequently denied the project's application for a Certificate of Public Convenience and Necessity, citing its location and impact in an environmentally-sensitive area.[15] The experience of Northern Gateway illustrates the risks that companies must assess in considering whether to invest in and apply for regulatory permits for major pipeline projects. Regulatory agency procedures and outcomes, though potentially lengthy, can be more predictable than ultimate government approvals, which are susceptible to varying political pressures.

The next section of the report provides an overview of the typical development process for pipeline projects, as well as preliminary data and analysis of the direct and indirect costs associated with applying for and obtaining regulatory approvals.

Costs of Regulatory Applications for Major Pipelines

The process of developing major pipeline projects and applying for regulatory approvals is highly complex and costly, requiring significant levels of expertise and financial resources from proponent companies.

---

[15] The Order in Council states:

> Whereas the Report identified impacts from the Project that the Panel believed would be likely to cause significant adverse environmental effects for certain populations of woodland caribou and grizzly bear;
>
> Whereas evidence was received by the Panel on the unique and irreplaceable nature of the ecosystem of the Great Bear Rainforest, which includes the Douglas Channel;
>
> Whereas the Governor in Council is of the view that the waters of the Douglas Channel are part of a sensitive ecosystem that must be protected from spills of crude oil from tankers;
>
> Whereas the Report disclosed that the Project would result in 220 tankers annually transiting the waters of the Douglas Channel carrying crude oil, diluent, or condensate, or any combination of them;
>
> Whereas the Governor in Council does not accept the Panel's finding that the Project, if constructed and operated in full compliance with the conditions set out in Appendix 1 of Volume 2 of the Report, is and will be required by the present and future convenience and necessity, and does not accept the Panel's recommendation;
>
> And whereas the Governor in Council is of the view that the Project is not in the public interest;
>
> Therefore, His Excellency the Governor General in Council, on the recommendation of the Minister of Natural Resources…directs the Board to dismiss Northern Gateway Pipelines Limited Partnership's application for a certificate, in respect of the construction and operation of a terminal at Kitimat, British Columbia and two parallel pipelines between Bruderheim, Alberta and Kitimat. See Privy Council Office, Orders in Council, PC Number 2016-1047, 25 Nov 2016, http://www.pco-bcp.gc.ca/oic-ddc.asp.

Prior to application for a permit from the NEB, major pipeline projects undergo substantial assessment and vetting—both within the proponent company and in financial markets.[16] A business case for a major infrastructure project must be developed by the company's senior executive team and approved by the board of directors. The primary aim of this exercise is to assess the economic and financial feasibility of the project, which requires (a) appraisal of potential shipper contracts, (b) preliminary evaluation of the technical requirements and cost of the project, (c) review of stakeholder consultations, and (d) predictions of the regulatory process and outcomes. Excessive market and regulatory risks lower the risk-adjusted expected financial returns of a project, reducing the likelihood of board approval.

The formal regulatory process for major projects begins with submission to the NEB of a pre-application project description at least three months in advance of the complete application. The project description includes information about the nature of the project and its route; any contacts or consultations with Aboriginal groups; consultations conducted with the public and other stakeholders; and preliminary assessments of the project's environmental and socio-economic impact. The project description is then used by the NEB to determine the appropriate regulatory review process.

Complete project applications require extensive documentation of engineering specifications and commercial justification, along with environmental and socio-economic studies regarding the potential effects of the proposed pipeline. Documentation of past and future notification, consultation, and engagement plans with the public, Aboriginal groups, and other stakeholders is also mandatory. For major projects, undertaking these studies and consultations can take several years, involving dedicated teams of engineers, environmental experts, scientists, community relations advisors, Aboriginal liaisons, accountants, lawyers, economists, and other management functions.

Project applications thus represent massive undertakings for developers, and the formal written submissions often comprise thousands of pages. For example, the detailed application for the Energy East Pipeline contained nearly 39,000 pages and described interactions with more than 7,000 individuals, 5,800 landowners, and 166 Aboriginal communities.[17] According to TransCanada's mid-2015 quarterly report, the Energy East project had incurred costs of $700 million to date (which was before NEB hearings had commenced), one estimate of the project's development and regulatory costs by that point.[18].

---

16 In this report, "major pipeline projects" refers to those governed by section 52 of the NEB Act (over 40 km in length), which are physical projects with new pipeline construction.

17 TransCanada Energy East Pipeline, Regulatory Filing Overview, accessed 27 Mar 2017, http://www.energyeastpipeline.com/regulatory-filing/overview/.

18 Krugel, L., The Globe and Mail, "TransCanada says $12-billion cost of Energy East pipeline project to rise", 31 Jul 2015.

Once the NEB deems an application sufficiently complete, regulatory review begins. During this period, developers continue to engage in consultations with the public, Aboriginal groups, and other stakeholders, and participate in the NEB hearing process, responding to intervenors. Once hearings are completed, the NEB issues a recommendation to the GIC on section 52 applications, or it makes a decision on section 58 applications. The recommendation or decision can include a variety of operating conditions that the developer must adhere to if they proceed to construct the project.

Data on regulatory review duration and outcomes for major pipeline projects reviewed by the NEB during the past decade are shown in Table 1. Large scale projects that are several hundred km in length, or longer, and that cross multiple provinces appear to have quite different regulatory durations than smaller projects. For instance, for projects more than 500 km, the average time from the proponent's application filing date to the NEB final report date was 27 months, with considerable variation among these projects (standard deviation of 24 months). For section 52 projects less than 500 km, the average review duration was 11 months (with a standard deviation of 3 months). While projects usually receive GIC approval, subject to NEB conditions, government scrutiny is greater for the largest project applications, as judged by the duration of GIC review. Hence, regulatory and political uncertainties appear to be qualitatively greater for large scale pipeline projects.

According to pipeline industry estimates, the direct costs for project proponents of development and regulatory applications account for 4%-11% of total pipeline development and construction costs, with an average of 7%. For a major pipeline project, such as Energy East, with a total expected installed cost of $15.7 billion, 7% is equivalent to $1.1 billion. For a smaller project with a total cost of $500 million, the regulatory application component would be approximately $35 million. Few companies have the resources and ability to commit such amounts (which cannot be recovered in the instance of regulatory denial) unless there is a very high likelihood of receiving regulatory approval without conditions that undermine the business rationale for the project.

In practice, pipeline companies' financial exposure to regulatory denial or delay is typically larger than the direct cost of the regulatory application, due to contractual obligations with shippers and suppliers. Shippers often require a commitment by the pipeline company for an in-service operating date for the pipeline; and purchase order lead times for specialized pipe, materials and machinery from suppliers, who may be located in other countries, often require contractual commitments to be agreed before regulatory approvals have been obtained.

Unexpected delays in regulatory approvals, or denials, can thus impose significant costs on pipeline companies.[19]

TransCanada's Keystone XL pipeline provides an illustration of this challenge for companies. Due to competitive pressures between pipeline companies for shipping contracts in 2008, TransCanada had committed to have the Keystone XL pipeline in service by a specified date. At the time, there was little reason to believe that the project would not obtain regulatory approval, or even face a delay, given the rapid prior regulatory approval of the Base Keystone pipeline. In order to meet this timeline TransCanada committed to acquire pipe and other construction materials in advance of obtaining leave to construct, expecting the regulatory process to unfold smoothly as in the past. Consequently, after the pipeline was unexpectedly denied a Presidential Permit in the United States, the company was left with project-specific materials that could not be repurposed for other projects, and reported a loss attributable to the project of $1-2 billion.

One way to illustrate the impact of the cost of applying for regulatory permits on pipeline company investment decisions is to consider a simple model of return on investment using the Northern Gateway project as an example. According to media reports and corporate disclosure documents, Enbridge spent an estimated $656 million over more than three years developing the project, with a total anticipated capital investment of $7.9 billion. Under assumptions of a 30-year capital recovery period, 5.5% cost of long-term debt, 10.5% cost of equity, and 6% corporate discount rate (which reflect industry expert estimates), the net present value (NPV) of the Northern Gateway project would be approximately $1 billion. This net present value calculation assumes equal annual payments over the entire capital recovery period, discounted at the corporate cost of capital, and provides a measure of the project's profitability over the entire period. Precisely what portion of the $656 million is directly attributable to the regulatory process is unknown; however, it is striking that the amount spent, while failing to obtain an approval, is of similar magnitude to the estimated net present value of the entire project. To have originally justified regulatory application expenditures of this magnitude, Enbridge would need to have been quite certain the project would ultimately be approved.

More generally, with such significant sunk costs involved in development and regulatory applications for major pipeline projects, the perceived risks of regulatory denial do not have to be very high to dissuade investment and to encourage firms to seek other jurisdictions where risk-adjusted returns are more favorable. Figure 1 illustrates the sensitivity of investment decisions to changes in the perceived probability of regulatory approval and upfront development and

[19] Conditions that constitute part of NEB approval can also represent significant and unexpected increases in project costs. In the case of Enbridge's Line 9B Reversal and Line 9 Capacity Expansion project, the pipeline's in-service date was delayed by about a year due to the NEB's requirements for additional shut-off valves and safety tests. The estimated additional cost attributed to the delay was $100 million, raising the total costs to $800 million, an increase of 12.5%. See Healing, D., Calgary Herald, "Much-delayed Enbridge Line 9 pipeline project wins NEB approval", 30 Sep 2015.

regulatory application costs for a hypothetical pipeline. In this example (as shown in Table 2), the total installed cost of the pipeline is assumed to be $5 billion, and the financing costs and discount rates are the same as assumed in the Northern Gateway example above. Based on these assumptions, the net present value of the project is $686 million. The x-axis shows the range of possible regulatory application costs, ranging from zero up to $700 million (the mid point, $350 million, is 7% of the total project cost).

The upward sloping line of Figure 1 depicts the combinations of regulatory costs and probabilities of project approval that define the break-even conditions for the pipeline project. In other words, the line shows, for any given level of regulatory cost, the minimum required anticipated probability that the project will be approved in order for the proponent to proceed with the project application (the expected net present value is greater than zero). It is clear that as regulatory costs increase, project proponents need to have much greater confidence that the project will be approved in order to warrant incurring sunk regulatory costs. For instance, if regulatory costs were $686 million, the proponent would need to be 100% certain the project would be approved in order to invest (and then yield $686 million in net present value). If regulatory costs were the industry average of 7% ($350 million), the probability of approval would need to be at least 51% to justify the expenditure. If the perceived likelihood of approval was less than this amount the project would have a negative expected net present value, and the developer would not propose the project for regulatory review.

While this stylized model reflects a set of particular assumptions, it illustrates a fundamental trade-off for developers in their investment decisions: as sunk regulatory application costs increase, regulatory approval risks and uncertainties need to decrease in order to support continued investment in pipeline infrastructure.

Options for Regulatory Reform for Major Pipeline Project Approvals

Firms assume considerable operational, financial and reputational risks when they undertake infrastructure projects costing billions of dollars. Raising capital for major pipeline projects is challenging in favorable economic climates, and more so in the context of low and volatile commodity prices and low global economic growth. Regulatory risks and costs are an important component of firms' and investors' assessments of whether the overall investment environment warrants long-term commitment of capital. In Canada, a challenge for major pipeline investment is that the sunk costs of regulatory applications and project development are significant and viewed as having increased substantially over the last decade. Firms often must invest hundreds of millions of dollars in order to apply first for regulatory review, and secondly for government review, of large scale projects - none of which is recoverable should the project be denied. At the same time, industry perceives that the risks of denial of major project applications by the government have increased, given the politicization of major pipeline projects. This perception is

consistent with the government having considerable discretion, as specified in the NEB Act, to overturn expert agency recommendations. The simple arithmetic of increased risk and high sunk costs yields lower expected financial returns for major pipeline projects, a deterrent to investment.

Two structural reforms to the approvals process for major pipeline projects would reduce approval uncertainty, enhancing the predictability of the policy environment for new investment. The first is to rescind the requirement for GIC approval, allowing the regulatory approval process to operate like that in the United States with the independent regulator (the NEB) as sole decision-maker, subject to appeal to the courts. This may require a revised legislated mandate of the specific criteria the NEB should incorporate in its decision process. A similar recommendation was made in an interim report on facilitating crude oil transport by the Standing Senate Committee on Transport and Communications, which advocated ending final approvals of NEB decisions by the GIC. According to the Committee, "The fact that Board decisions are subject to final approval from the [GIC] (the Governor General, acting on the advice of Cabinet) erodes the Board's authority and virtually ensures the approvals process is highly politicized."[20]

The second option is a two-stage approval process for major pipeline projects that sequences the political determination of the public interest before the technical review of the project by the NEB. Proposals for a two-stage review process vary, but these plans typically involve a national interest determination by the GIC (facilitated by the NEB) in the first stage, with the project developer submitting a condensed application similar to current pre-application filings with the NEB. The initial review stage would address a broad range of policy issues, including those outside the mandate of the NEB, and would be completed within a relatively short time frame. Subsequently, if the project was found to be in the national interest and the developer wished to pursue the project under conditions attached during the first stage, a second stage consisting of a technical review would commence, during which the NEB would have final authority to issue or deny a certificate and to include operating conditions. Under this approach, uncertainty about government approval would be resolved early in the broader approvals process, and the cost to project proponents of developing and submitting regulatory applications for reaching the government assessment stage would be significantly less than the current system.

The results and conclusions reached in this report offer a preliminary assessment of the costs and risks attributable to the regulatory process for major pipeline project proponents. The data collected are primarily from public sources, such as media and analyst reports, corporate financial documents, and government regulatory filings; this data collection is ongoing. The Ivey Energy Policy and Management Centre is also engaged in several related research projects, which are either currently in progress or planned to commence in 2017/18. These include (1) a

[20] Dawson, D. and M. MacDonald, "Pipelines for Oil: Protecting our Economy, Respecting our Environment", Interim Report of the Standing Senate Committee on Transport and Communications, p.2.

comparison of the NEB approvals process and regulatory approvals processes in other countries and sectors, (2) an investigation of the location of capital expenditures by public energy companies operating in Canada, and (3) an assessment of how stakeholder intervention in regulatory processes has changed over time.

Table 1: Major Pipeline Projects Reviewed by the National Energy Board, 2007-2017

Project	Fuel Type	Application Filing Date	New Construction Length (km)	NEB Report Date	NEB Decision	NEB Duration (months)	GIC Decision Date	GIC Decision	GIC Duration (months)
Base Keystone	Oil	Dec-2006	1235	Sep-2007	Approval	9	Nov-2007	Approved	2
Mackenzie Valley	Gas	Oct-2004	1196	Dec-2010	Approval	74	Mar-2011	Approved	2
Northern Gateway	Oil	May-2010	1178	Dec-2013	Approval	42	Nov-2016	Denied	*
Alberta Clipper Expansion	Oil	May-2007	1074	Feb-2008	Approval	8	May-2008	Approved	3
Line 3 Replacement	Oil	Nov-2014	1067	Apr-2016	Approval	17	Nov-2016	Approved	7
Trans Mountain Expansion	Oil	Dec-2012	981	May-2016	Approval	41	Nov-2016	Approved	6
Vantage	Gas	Feb-2011	578	Jan-2012	Approval	11	Mar-2012	Approved	1
Keystone XL	Oil	Feb-2009	529	Mar-2010	Approval	12	Apr-2010	Approved	1
North Montney	Gas	Nov-2013	301	Apr-2015	Approval	17	Jun-2015	Approved	1
Southern Lights	Oil	Mar-2007	288	Feb-2008	Approval	11	May-2008	Approved	2
2017 NGTL System Expansion	Gas	Mar-2015	230	Jun-2016	Approval	14	Oct-2016	Approved	4
Edmonton to Hardisty	Oil	Dec-2012	182	Jan-2014	Approval	13	Apr-2014	Approved	2
Deep Panuke	Gas	Nov-2006	176	Sep-2007	Approval	10	Sep-2007	Approved	<1
Komie North Extension	Gas	Oct-2011	166	Jan-2013	Partial Approval	14	Apr-2013	Partial Approval	3
Horn River	Gas	Feb-2010	155	Jan-2011	Approval	11	Feb-2011	Approved	<1
Redwillow	Gas	Dec-2007	150	Mar-2009	Approval	15	Apr-2009	Approved	<1
Brunswick	LNG	May-2006	145	May-2007	Approval	12	Jun-2007	Approved	<1
Line 4 Extension	Oil	Jun-2007	138	Apr-2008	Approval	9	Jun-2008	Approved	2
Bakken	Oil	Jan-2011	123	Dec-2011	Approval	11	Mar-2012	Approved	2
Northwest Mainline Expansion	Gas	Apr-2011	111	Feb-2012	Approval	9	May-2012	Approved	2
South Peace	Gas	Feb-2008	92	Nov-2008	Approval	8	Jan-2009	Approved	1
Towerbirch Expansion	Gas	Sep-2015	87	Oct-2016	Approval	13	Mar-2017	Approved	5
Groundbirch	Gas	Apr-2009	77	Mar-2010	Approval	10	Apr-2010	Approved	1
Leismer to Kettle River Crossover	Gas	Jul-2011	77	Jun-2012	Approval	11	Sep-2012	Approved	2
Wolverine River Lateral Loop	Gas	Mar-2014	61	Mar-2015	Approval	11	May-2015	Approved	2
Alida to Cromer Capacity Expansion	LNG	Jan-2007	60	Jun-2007	Approval	4	Sep-2007	Approved	3

(*) Northern Gateway was initially approved by the GIC in 2014, but later denied after the decision was reversed on appeal by the federal court and returned to the government for reconsideration. The final denial came 35 months after the NEB Report date.

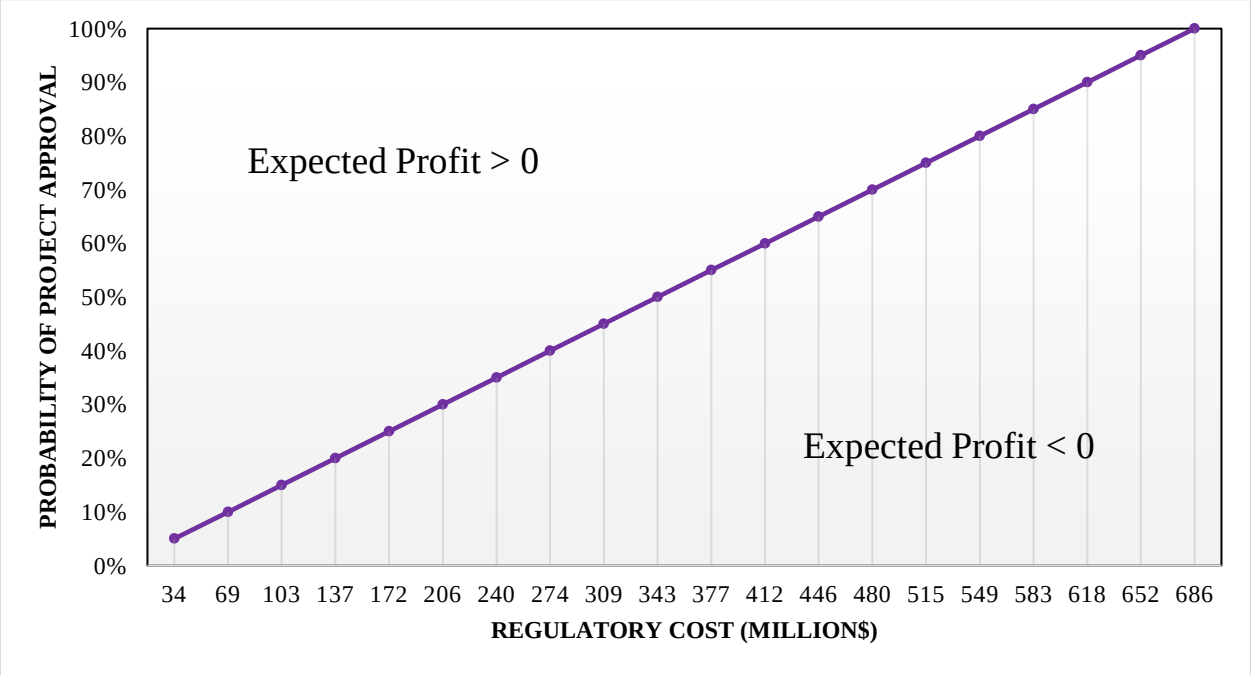
Sources: Privy Council Office, Orders in Council, http://www.pco-bcp.gc.ca/oic-ddc.asp; National Energy Board, REGDOCS, https://apps.neb-one.gc.ca/REGDOCS/; National Energy Board, Major Applications and Projects before the NEB, https://www.neb-one.gc.ca/pplctnflng/mjrpp/index-eng.html and http://www.neb-one.gc.ca/pplctnflng/mjrpp/archive/index-eng.html.

Table 2: Net Present Value Model of Illustrative Pipeline Project

Assumptions	
Total Installed Cost of Pipeline	$5,000 million
Equity Ratio	35%
Debt Ratio	65%
Return on Equity	10.5%
Cost of Debt	5.5%
Implied Project Weighted Average Cost of Capital	7.3%
Capital Recovery Period	30 years
Discount Rate (Corporation Cost of Capital)	6%
Regulatory Cost (7% of investment cost)	$350 million

Investment Principal Balance	$5,000 million
Level Annual Payment Amount	$350 million
Net Present Value of Payments	**$686 million**

Figure 1: Project Profitability by Regulatory Cost and Probability of Project Approval



References

Alberta Utilities Commission, Rule 020: Rules Respecting Gas Utility Pipelines, accessed 27 Mar 2017, http://www.auc.ab.ca/regulatory_documents/Consultations/2014-12-08-Rule020.pdf

Dawson, D. and M. MacDonald, “Pipelines for Oil: Protecting our Economy, Respecting our Environment”, Interim Report of the Standing Senate Committee on Transport and Communications, December 2016, https://sencanada.ca/content/sen/committee/421/TRCM/Reports/FINALVERSION-PipelineStudy-2016-12-07_e.pdf

National Energy Board Act, RSC 1985, c N-7, accessed 27 Mar 2017, http://laws-lois.justice.gc.ca/eng/acts/N-7/

National Energy Board, Court Challenges to National Energy Board or Governor in Council Decisions, accessed 27 Mar 2017, https://www.neb-one.gc.ca/pplctnflng/crt/index-eng.html

National Energy Board, National Energy Board- fact sheet, accessed 27 Mar 2017, https://www.neb-one.gc.ca/bts/whwr/nbfctsht-eng.html

National Energy Board, Presentation to the Expert Panel Conducting the NEB Modernization Review, Deck 2: Overview of the National Energy Board’s Current Structure, Role and Mandate, 29 Nov 2016, accessed 27 Mar 2017, https://www.neb-one.gc.ca/bts/nws/spch/2017/ntrnltrnsfrmtnpt2/ntrnltrnsfrmtnpt2-eng.html

Natural Resources Canada, Energy Markets Fact Book: 2016-2017, accessed 27 Mar 2017, https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/EnergyFactBook_2016_17_En.pdf

Watson, Peter, National Energy Board Technical Briefing for the NEB Modernization Expert Panel, Ottawa, 29 Nov 2016, Speech, accessed 27 Mar 2017, http://news.gc.ca/web/article-en.do?mthd=tp&crtr.page=1&nid=1185139&crtr.tp1D=970

Authors

Guy Holburn is the Suncor Chair in Energy Policy and an Associate Professor of Business, Economics, and Public Policy at the Ivey Business School. He is also the founder and Director of the Ivey Energy Policy and Management Centre. His area of expertise is in the intersection of business strategy and public policy. Much of his research is applied to strategy and policy issues in the energy and utilities sectors. He has been awarded major research grants, has published widely in leading economics and management journals, and has written for national media. He is currently leading a multi-year research program on the regulation of the energy sector in Canada. He received his MA and PhD from the University of California, Berkeley, and his BA Hons. (First Class) from Cambridge University.

Margaret Loudermilk is the Ivey Energy Policy and Management Centre's Research Director and an Adjunct Research Professor in the Business, Economics and Public Policy group at Ivey. Her research is mainly methodological and focuses on measuring the economic impacts of energy policies. She is now leading major new research projects for the Centre on social license in the energy and infrastructure sectors. Prior to joining Ivey, she was a Research Scientist at the University of Chicago's Center for Robust Decision Making on Climate and Energy Policy, as well as an Adjunct Professor of Econometrics and Statistics at the University of Chicago's Booth School of Business. She received her PhD in Economics from Michigan State University.